

WHAT IS CLAIMED IS:

1. A disk drive comprising:

a disk medium;

5 a read head which reads a read signal from the disk medium, the read signal containing data recorded in a data field on the disk medium and a sync pattern used to detect a leading position of the data field;

10 a binary data generation unit which generates a binary data sequence from the read signal, the binary data sequence corresponding to the data and the sync pattern; and

a sync detection unit which uses the read signal to determine the leading position of the sync pattern and detects the sync pattern in the binary data  
15 sequence in accordance with a result of the detection.

2. The disk drive according to claim 1, further comprising:

20 a read channel which processes the read signal to reproduce data and which includes the binary data generation unit and the sync detection unit.

3. The disk drive according to claim 1, further comprising:

25 a decoding unit which decodes the data from the binary data sequence in accordance with a detection signal for the sync pattern from the sync detection unit.

4. The disk drive according to claim 1, wherein

the sync detection unit includes a prediction unit which determines the leading position of the sync pattern, and

5       the prediction unit outputs a determination signal indicative of the leading position when an amplitude value of the read signal indicates a preset expected value.

10       5. The disk drive according to claim 1, wherein the sync detection unit includes a unit which compares the binary data sequence with a reference data sequence corresponding to the sync pattern and which generates a detection signal for the sync pattern when a result of the comparison indicates that the data sequences are matched, and

15       an output control unit which provides such control as outputs the detection signal for the sync pattern in accordance with the result of determination indicative of the leading position of the sync pattern.

20       6. The disk drive according to claim 4, wherein the sync detection unit includes a unit which compares the binary data sequence with a reference data sequence corresponding to the sync pattern and which generates a detection signal for the sync pattern when  
25       a result of the comparison indicates that the data sequences are matched, and

an output control unit which provides such

control as outputs the detection signal for the sync pattern using the determination signal outputted by the prediction unit and indicating the leading position of the sync pattern.

5           7. A disk drive comprising:

          a disk medium on which a sector format including a preamble area, sync mark area, and a data field is formed;

          a read head which reads a read signal from the  
10       sector format on the disk medium; and

          a read channel which processes the read signal to reproduce data, the read channel including:

          a binary data generation unit which generates,  
          from the read signal, a binary data sequence corresponding to data recorded in the data field and a sync  
15       pattern recorded in the sync mark area; and

          a sync detection unit which detects the sync pattern in the binary data sequence, which includes a prediction unit generating an end signal for the  
20       preamble area in order to determine the leading position of the sync pattern using the read signal, and which outputs a detection signal for the sync pattern in accordance with the end signal for the preamble area.

25           8. The disk drive according to claim 7, wherein the read channel includes, in front of the binary data generation unit, a timing signal generation unit which

generate a timing signal required for a data reproduction process, from a part of the read signal corresponding to the preamble area, and

5        wherein the prediction unit generates the end signal for the preamble area using the signal outputted by the timing signal generation unit.

9. The disk drive according to claim 7, wherein the read channel includes, in front of the binary data generation unit, a timing signal generation unit  
10       which generate a timing signal required for a data reproduction process, from a part of the read signal corresponding to the preamble area, and

      an A/D converter which converts an analog signal waveform of the read signal into a digital signal,

15       wherein the timing signal generation unit includes a phase difference detection unit which receives the digital signal outputted by the A/D converter as an input to detect a phase difference between the timing signal required for the data  
20       reproduction process and the part of the read signal corresponding to the preamble area, and

      wherein the prediction unit generates the end signal for the preamble area using a phase difference detection signal outputted by the phase difference  
25       detection unit.

10. The disk drive according to claim 7, wherein the read channel includes, in front of the binary data

generation unit, an A/D converter which converts an analog signal waveform of the read signal into a digital signal, and

5 a digital equalization unit which receives the digital signal outputted by the A/D converter as an input and executes a digital waveform equalization process, and

10 wherein the prediction unit generates the end signal for the preamble area using a signal outputted by the digital equalization unit.

11. The disk drive according to claim 7, wherein the sync detection unit includes a unit which compares the binary data sequence with a reference data sequence corresponding to the sync pattern and which  
15 generates a detection signal for the sync pattern when a result of the comparison indicates that the data sequences are matched, and

20 an output control gate which provides such control as outputs the detection signal for the sync pattern in accordance with the end signal for the preamble area outputted by the prediction unit.

12. The disk drive according to claim 9, wherein the prediction unit compares an amplitude value of the phase difference detection signal outputted by the  
25 phase difference detection unit with a present expected value and outputs the end signal for the preamble area when the amplitude value indicates the

expected value.

13. The disk drive according to claim 10, wherein the prediction unit compares a digital signal sequence outputted by the digital equalization unit with a  
5 prepared reference digital signal sequence corresponding to the end signal for the preamble area, and outputs the end signal for the preamble area in accordance with a result of the comparison.

14. A method of detecting a sync mark, the method  
10 comprising:

in a disk drive including a disk medium and a read head which reads, from the disk medium, a read signal containing data recorded in a data field on the disk medium and a sync pattern used to detect a  
15 leading position of the data field,

generating a binary data sequence corresponding to the data and the sync pattern, from the read signal;

using the read signal to determine a leading  
20 position of the sync pattern; and

outputting a detection signal for the sync pattern from the binary data sequence in accordance with a result of the determination of the leading position of the sync pattern.

25 15. A method according to claim 14, further comprising decoding the data from the binary data sequence in accordance with the detection signal for

the sync pattern.

16. A method according to claim 14, wherein the binary data sequence is compared with a reference data sequence corresponding to the sync pattern, and a  
5 detection signal for the sync pattern is generated when a result of the comparison indicates that the data sequences are matched, and

wherein the detection signal for the sync pattern is outputted using a determination signal indicative  
10 of the leading position of the sync pattern.

17. A method according to claim 14, further comprising generating an end signal for a preamble area on the disk medium in order to determine the leading position of the sync pattern using the read  
15 signal, and

outputting the detection signal for the sync pattern in accordance with the end signal for the preamble area.

18. A method according to claim 17, further  
20 comprising:

before the process of generating the binary data sequence, generating a timing signal required for a data reproduction process, from a part of the read signal corresponding to the preamble area, and  
25 generating the end signal for the preamble area using the timing signal.

19. A method according to claim 17, further

comprising:

- before the process of generating the binary data sequence, converting an analog signal waveform of the read signal into a digital signal,
- 5        receiving the digital signal as an input and executing a digital waveform equalization process; and
- generating the end signal for the preamble area using a digital signal sequence obtained by the digital waveform equalization process.